Tuberculosis control: In the context of the increasing AIDS epidemic

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In the increasing epidemic of the deadly duo "HIV & Tuberculosis",there are synergistic effects of HIV on TB and vice versa. Due to such relationship, the problem of multidrug resistant tuberculosis (MDR-TB) has also the propensity to become substantial, particularly in the developing countries like Nepal. In these situations, various roles of the National Tuberculosis Centre (NTC), particularly in maintaining the satisfactory treatment completion rate at least in the regions where it is increasingly implementing the short course chemotherapy (SCC) for tuberculosis, have been emphasized.

Key words: TB, HIV, AIDS, multidrug resistant tuberculosis (MDR-TB), National Tuberculosis Programme (NTP), National Tuberculosis Centre (NTC), short course chemotherapy (SCC).

INTRODUCTION

Tuberculosis has experienced a major resurgence in the context of the AIDS epidemic. More than one third of the world's population is infected with tuberculosis[1,2] and HIV has appeared in the scene causing severe setback in the control of tuberculosis.Even in the United States of America a 20-year decline in the number of new cases ended in 1986 and the number of new cases per year has since been on a steady increase.[2] By 1990, at least one third of all TB cases in New York City were among the HIV positive people only.[3] In April 1993, the World Health Organization declared a "Global TB Emergency".[1] Majority of persons infected with tuberculosis and HIV live in developing countries, including Nepal, hence it is of great concern to us.

EFFECT OF HIV ON TB

TB Prevalence:

Breakdown of tuberculosis infection to disease is dependent upon the immune status of the person. HIV, as the name itself suggests, makes a person severely immunodeficient by predominantly affecting CD4+ T cells. HIV infection increases the risk of developing active tuberculosis by a factor of 15 to 30[2]; even up to 170 fold increased risk of reactivation of latent infection with M. tuberculosis has been suggested.[4] Even though in industrialised countries, various unusual opportunistic infections (eg due to *Pneumocystis carinii, Mycobacterium avium* complex, *Toxoplasma gondii, Cryptococcus neoformans* etc) are the major clinical problems in AIDS patients, it is the

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tuberculosis in developing ones; as more than half of the adult population here already have latent infection with the organism.[5] Thus, 52 to 70% of the reported AIDS patients in Nepal, India and Thailand have had tuberculosis.[6,7] A study from Bombay reports the HIV seropositivity in tuberculosis patients increased from 2.56% in 1988 to 10.15% in 1994.[8]

Clinical Features:

Unlike other serious opportunistic infections, tuberculosis often develops relatively early in the course of HIV infection.[2] The clinical features of tuberculosis in HIV infected patients are quite varied and broadly show two different patterns. In patients with relatively high CD4 + T cell counts, the typical pattern of pulmonary reactivation occurs with classical cavitary apical diseases of the upper lobes in Xray chest. Where as in patients with low CD4 counts, a disseminated pattern of tuberculosis occurs and Xray chest may reveal diffuse or interstitial or miliary infiltrates, with often pleural effusion and lymphadenopathy, hilar or mediastinal, present. Approximately 60 to 80% of patients will have pulmonary disease and 30 to 40% will have extrapulmonary disease. The incidence of extrapulmory tuberculosis is relatively high among HIV infected individuals and any organs could be affected.

Diagnosis:

Diagnosis of TB in HIV infected individuals may be difficult, and a high index of suspicion may be needed. As already mentioned, Xray chest are not always typical. Sputum smear examination should be given high priority for management of the patients[9]; but in more advanced HIV disease, tuberculosis may be disseminated with sputum smear positivity likely to be low. In one series, only 48% of HIV seropositive tuberculosis patients were sputum smear positive as compared to 70% in seronegatives.[10] As far as the tuberculin test is concerned, in HIV infection it may also be unhelpful as it is frequently negative because of the immune defect. Since tuberculosis is likely to be disseminated in particulary more advanced HIV disease, blood culture examination may help in the diagnosis of TB in these patients. Positive blood culture is reported in 26-42% of patients with HIV infection and tuberculosis.[11]

Treatment:

Initial intensive phase is advised with four drugs, particularly for smear positive pulmonary TB, or even 5 drugs, if drug resistance is suspected.[2] Injection of streptomycin should obviously be used with all sterilisation precautions for fear of transmission of HIV; if possible should probably be best avoided.[12] Adverse reaction to drugs, including antiTB, are relatively more common in HIV positive patients. Thioacetazone should preferably not be used in persons known to be or suspected of being HIV infected, because of the occurrence of severe hypersensitivity reactions. And in one series, 18 percent of patients experienced a drug reaction also with rifampicin.[2] As far as duration of therapy is concerned, WHO has recommended that the HIV positive patients be treated similar to the HIV seronegative TB patients;[10] but slightly longer duration of therapy is recommended in industrialised countries.[2,10,11,13]

Multidrug resistant tuberculosis (MDR-TB):

With HIV pandemic, a major emerging problem has been the increasing identification of strains of M. tuberculosis resistant of two or more first line drugs, usually isoniazid and rifampicin, so called MDR-TB.[2,14] MDR-TB have been seen with increasing frequency in the United States, especially in New York city where 20 to 25% of newly diagnosed patients with tuberculosis currently have organisms resistant to INH and rifampicin.[15] There are also reports of HIV-negative health workers acquiring MDR-TB.[16] Recently, the first outbreak of hospital acquired MDR-TB has been in England, in a London HIV unit .[17] In UK, the drug resistant isolates of M. Tuberculosis had increased from 8% in 1987 to 14% in 1991.[16] Data from the other parts of the world,[3] particularly the developing countries, are

scarce, but the problem of MDR-TB has the obvious propensity to become substantial with increasing epidemic of both HIV and TB.

EFFECT OF TB ON HIV INFECTION

There is evidence that in HIV infected individuals, tuberculosis as such also increases the progression of HIV infection.[18] Tuberculosis and various diseases seems to accelerate the HIV disease by activation of T4 lymphocytes and macrophages leading to more (AIDS) viral replications.[10,19,20] And the onset of tuberculosis in patients with AIDS seems to predict a substantial increase in mortality.[21] There are, indeed, preliminary observations that tuberculosis preventive chemotherapy (chemoprophylaxis may offer the possibility of prolonging the survival of persons with HIV.[18] The chemoprophylaxis for TB for this indication is not recommended procedure under National TB Programme in most developing countries, but it can be used for individuals having both HIV and TB infections.[2,18] Finally, tuberculosis may also interfere with HIV tests; there are reports of possibility of HIV ELISA and western blot tests yielding false positive results in individuals infected with M. tuberculosis and M. leprae.[22,23]

AIDS AND NATIONAL TUBERCULOSIS PROGRAMME (NTP)

AIDS will, thus, have major impact on the epidemiology of tuberculosis and National Tuberculosis Programme (NTP) will, naturally, have to face the various problems increasingly raised by it. Now, National Tuberculosis (NTC), of any country, cannot plan NTP solely on the basis of "preAIDS era" experience of TB control. NTCs (all over the world) should naturally broaden their vision and tackle the national (global) emergency in planned way. Let us discuss a few of the important issues.

Monitoring HIV infections among TB patients:

Monitoring the trends of HIV infection among TB patients obviously help to plan properly for both AIDS and TB control. Both NTC and National Centre for AIDS and STD Control should cooperate with each other in this regard.

Case holding & MDR - TB:

National TB Centre (NTC) has already implemented short course chemotherapy (SCC) for TB in a few districts and it is planning to cover the whole country by the year 2000.[1] But NTC should not be just satisfied with the numbers of the districts covered, it should continuously give top priority to the case holding i.e. the cure rate of 85% for new smear positive cases. Recent reports from India revealed the treatment completion rate, on average, of about 43% to 52% only for even short course chemotherapy (SCC) in field conditions.[15,24,25] And, in one report, there was also some problem of need to change over to the long term standard regimen in 5,080 (6.7%) patients mostly due to nonavailability of the SCC drugs.[24] There were also many other practical field difficulties like underreporting, unavailability of trained manpower and equipments etc.[25] Thus, maintaining cure rate of atleast 85% is not easy particularly under long term field conditions; the major hurdles for this would be the problems of continously providing proper **"supervision and management".** At this juncture, it is important to realise that TB programme is in a way well ahead of other health sectors and the "economy" of the country as such. In most hospitals of the country, even drugs like penicillin, paracetamol, oral rehydration solution etc are not freely available for most poor patients. In this background, it is natural to have many field difficulties. NTC should, thus, try, their best not only to increase the numbers of districts covered with short course chemotherapy (SCC) programme, but also to maintain the high case holding in programme implemented districts. Otherwise the irregular treatment by the patients, in the background of increasing HIV problem, can lead to emergence of multidrug resistant tuberculosis (MDR-TB) epidemic in the country. Poorly managed TB control programmes are the primary source of

multidrug resistant tuberculosis.[3] Moreover, NTC is using most of the available drugs against tuberculosis in the SCC programme. The other available new drug, showing promise against TB, is quinolone group. But looking at the rampant use of ciprofloxacin in the community, it could be just a matter of time before M. tuberculosis (and typhoid bacilli as well) might increasingly develop resistance against this useful group of drugs. So, as we are firing all the "bullets" available, we must keep to the "targets" (or case holding), othewise at the end we may have nothing left to fight with.

Emphasizing AIDS control:

At first glance, it looks ridiculous "NTC emphasizing AIDS control!" But this is the need of the hour. Now tuberculosis would be very difficult if not impossible, to control without simultaneously making attempts to curtail the spread of AIDS, whatever possible. And the reason why it is so important for NTC, and in fact for all the medical professionals,[26] to emphasize such right now only, is that time is running out for AIDS control. This looks more imperative when we consider the fact that for AIDS control we do not have to accomplish expensive or difficult tasks;[20] we just have to publicize all over the country basic message about the spread of AIDS, mainly (>90%) by promiscuous heterosexual intercourse, and the efficacy of condom in its prevention. This simple course of action will save hundreds of thousands of people's lives[27] and prevent the occurrence of hundreds of thousands of tuberculosis cases. Ultimately, this is what is the aim of the NTC as such. NTC and NTP will have to bear the brunt of the apathy towards AIDS control. Thus NTC should not at all hesistate to emphasize the AIDS control to the concerned authorities.

Finally, not only the NTC team but also the concerned foreign and SAARC TB Centre (STC) experts should also consider all these issues seriously; this is, in fact, the problem of the whole region and the world as such.

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